Policy, Values, and EFT Research: Anatomy of a Research Agenda

Kenneth L. Kraemer
University of California, Irvine

Kent W. Colton
Brigham Young University

There is an emerging recognition that EFT systems have the potential to vastly alter the payment and fund transfer system in American society. A number of forces and actors are involved in this evolution, and the values vary significantly depending on individual and institutional perspectives. These value conflicts are highlighted in a six-part research agenda: technological issues in EFT, EFT impacts on people, economic impact of EFT, regulation and control of EFT, and evaluating and monitoring EFT systems.

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1. Introduction

In its final report of February 1977 [36], the National Commission on Electronic Fund Transfers (NCEFT) defined EFT as:

> . . . a payments system in which the processing and communications necessary to effect economic exchange, and the processing and communications necessary for the production and distribution of services incidental or related to economic exchange, are dependent wholly or in large part on the use of electronics.

Authors' present addresses: K. L. Kraemer, Public Policy Research Organization, Graduate School of Administration, University of California at Irvine, Irvine, CA 92717; K. W. Colton (on leave from MIT), Graduate School of Management, Brigham Young University, 210 JKB, Provo, UT 84602.

Table I. Major EFT Applications Currently in Development.

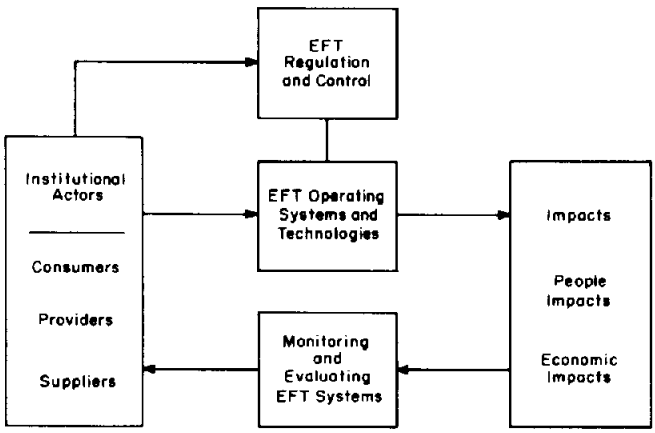
Subsystem or technique	Operation
Preauthorization procedures	
—direct deposit of regular payments (such as paychecks, welfare payments, retirement checks, stock dividends).	Once authorized, such deposits and payments are made automatically and electronically according to agreed-upon procedures.
—direct payment of recurrent expenses (such as house and car payments, utilities).	
—telephone "bill-payment."	Customers use the telephone to authorize financial institutions to pay monthly bills (generally through electronic transfers) or to transfer money from a savings to a checking account or vice versa.
Automated banking through EFT terminals	
—use of automatic teller machines (ATMs) to automate traditional banking activities such as depositing and withdrawing money from accounts or cashing checks.	ATMs provide 24-hour banking service through electronic terminals; almost 8,000 ATMs in place today.
—authorization of credit and checks.	A terminal is used to check the customer's credit and to determine whether the checking or credit accounts have adequate funds to handle the transaction in question.
Point-of-sale (POS) operations	
—facilitation of electronic transfer of money at the point of actual operation or sale (with a direct link to the customer's account).	Verify or guarantee a check electronically, or make a direct, electronic debit from a purchaser's account to the account of a business establishment at the point of sale (e.g., the "debit card").
National bank card networks	
—clearing of credit card vouchers.	Facilitate the electronic exchange of credit transactions and vouchers (e.g., National Bank Americard, Inc., Interbank Card Association).
Automated clearinghouse (ACH) procedures	
—facilitation of electronic exchange of money (both debits and credits) among financial institutions.	An electronic network(s) substitutes for the paper-oriented check-clearing system. Also provides the clearing facility for preauthorization procedures and POS operations, but use is small.

This innocuous definition of EFT hardly fits with the emerging recognition that EFT is a technologically-based system with the potential for vastly changing relationships among private enterprises, public institutions, and individuals throughout the country [2, 15, 27, 28]. The complexity of EFT is illustrated by the fact that it is not a single technological application; nor is it even composed of a unified group of technological applications. At least five different techniques characterize the applications being developed in this country: preauthorization procedures, automated banking through EFT terminals, point-of-sale (POS) operations, national bank card networks, and automated clearinghouse procedures (Table I). Individually and through a combination of these subsystems and techniques, EFT operating systems are being established in various areas throughout the country [20, 34, 35, 36, 40, 43]. However, such efforts are not established in a vacuum; their success, failure, and very nature are highly dependent on several major forces surrounding their development.

The Evolution of EFT: Major Forces and Values

Figure 1 presents an overview of the major forces involved in the evolution and development of EFT systems: institutional actors, EFT technology and operating systems, EFT regulation and control, impacts of EFT on people and the economy, and monitoring and evaluating EFT systems. Thus, the actual EFT operating systems are only one part of a much larger system. And because EFT operating systems are integrally linked with these other forces, they inherently are involved in the major public policy and political questions which traditionally relate to these other forces.

Fig. 1. The dynamics of EFT evolution and development.



To begin, the *institutional actors* involved in the provision and use of EFT technology play an important role in determining the overall shape of EFT operating systems. *Consumers* or *users* of EFT technology include those individuals, businesses, or governments who currently use EFT or who may do so in the future. What consumers and users will accept is a major determinant of what the *providers* of EFT, the financial institutions and retailers who currently offer or who could potentially offer EFT services, will offer. But the providers also may be expected to induce consumers to accept services that

are unfamiliar and, perhaps, not always in the consumers' interest. The providers of EFT also must deal with the *suppliers* of the technology, those who actually produce the hardware and software and supply specific services and equipment. Generally, the interests of these two groups—providers and suppliers—tend towards promotion and rapid deployment of EFT technologies.

Standing between these actors and EFT technologies are the government agencies which regulate and control EFT systems both directly and indirectly through regulation of the basic interactions among providers, suppliers, consumers, and users. State and federal laws and regulations not only prescribe the extent and nature of EFT development, but often set the framework within which EFT innovation may occur. Thus, the various *institutional actors* will seek to influence regulation in their favor, and, in turn, regulation and control will set boundaries for the development of EFT technology.

Once developed, *EFT operating systems and technologies* will have a substantial impact on society—*impacts on people* and *impacts on the economy*. These impacts may be expected to reinforce or to change any or all of the actors' views of the desirability of further developments. Indeed the evaluation and assessment of these impacts provide an essential "feedback loop" for understanding the dynamics of EFT development and a means of *monitoring and evaluating EFT systems* from the standpoint of each actor's interest. Given the varying interest, it is inevitable that conflict will develop among them and need to be resolved through the policy process.

The perspective and values which an individual brings to this framework will naturally result in varying assessments of the shape such impacts will take and the relevant parties to be included in the policy-making process. Kling [29, p. 643] has identified five major value orientations implicit in the published discussions of EFT systems:

(1) *Private enterprise model.* The preeminent consideration is profitability of the EFT systems, with the highest social good being the profitability of the firms providing or utilizing the systems. Other social goods such as users' privacy or the need of the government for data are secondary.
(2) *Statist model.* The strength and efficiency of government institutions are the highest goals. Government needs for access to personal data on citizens and needs for mechanisms to enforce obligations to the state always prevail over other considerations.
(3) *Libertarian model.* The civil liberties as specified by the U.S. Bill of Rights are to be maximized in any social choice. Other social purposes such as profitability or welfare of the state are to be sacrificed if they conflict with the prerogatives of the individual.
(4) *Neopopulist model.* The practices of public agencies and private enterprises should be easily intelligible to ordinary citizens and be responsible to their needs. Societal institutions should emphasize serving the common man.
(5) *Systems model.* The main goal is that EFT systems be technically well-organized, efficient, reliable, and aesthetically pleasing.

Developing an Agenda for EFT Research

We maintain that the value orientations which characterize the development of EFT also characterize the development of a research agenda for EFT. For example, when Congress established the time frame for the NCEFT, they insured (consciously or unconsciously) that both the relevant policy questions and the answers would be defined largely by the current participants in the U.S. payments system—the financial and retail community. This occurred because the short time frame meant that new research could not be conducted, and that the commission would have to rely on information mainly in the hands of financial institutions, their technology suppliers, and their consultants [5]. Of course, that fact also increased the opportunity for these actors to decide what research would be reported and what would not be reported.

This paper will describe a project to frame a research agenda *broader* in scope than the efforts of the NCEFT. Supported by a grant from the National Science Foundation, we developed a process[1] which brought together representatives of not only the key current participants but also representatives of other actors who are not now but who might become participants in the future—representatives of the full set of actors implied in Figure 1. These included representatives of: financial institutions such as banks and savings and loans; nondepository institutions such as department stores and supermarkets; state government institutions such as EFT commissions and regulatory agencies; federal government users such as the operators of automated clearinghouses and government regulators such as the Federal Reserve Board and the Federal Home Loan Bank Board; consumers including national consumer organizations and individual consumers; and the EFT technology industry such as equipment vendors and consultants. Moreover, we asked these people to consider what research was needed in the middle and the longer term, and whether the research was primarily important from their institutional interest, or from a broader national interest, or both.

We present the agenda which resulted from this process both for its inherent value in informing future research, and for its value in illustrating the conflicting value orientations which characterize the field. What emerges from our analysis is a clear indication that the very definition of what should be examined by the scientific method involves value conflicts not only because of the answers which might result, but also because the simple act of including an issue on the agenda might have political consequences. For example, both the providers and the suppliers of EFT technology continually expressed concern over research into potentially harmful impacts of EFT, such as consumer abuse, consumer costs, and consumer problems. They were worried that the very existence of such research might be construed by some policymakers as reason for slowing the development of EFT [7].

Thus, in the agenda itself and throughout its making, it is apparent that different actors prioritize and approach key issues differently depending upon their institutional setting and values. Although other value differences are apparent, the most consistent tension was between those

who favored free market determination of how EFT develops and those who favored more systematic, deliberate consideration of what societal goals should be served by EFT, given a fuller understanding of the likely and potential uses and impacts. The former perspective, based on the *private enterprise model*, sees market research conducted by the financial institutions in their own enlightened self-interest as the dominant if not the sole kind of research that is needed. Moreover, public acceptance and the use of EFT systems are viewed as proof of the appropriateness of this perspective, regardless of whether certain consumer groups are excluded. The latter perspective, which favored more systematic consideration of societal goals, is based on the more socially-oriented *libertarian* and *populist models*. It questions the adequacy of industry-dominated market research not only for the protection of consumers but also for the exploitation of the technology's potential in the broader interest of society. The following exchange [7] illustrates these varying perspectives:

> **Cox:** I think that we are witnessing a very fascinating series of statements here in which some of us who would really like to challenge the fundamental assumptions on which our political system, our economic system, and maybe even the religious basis of our society rest, have decided to use EFT as the vehicle for it today. And I think that makes it very hard to discuss EFT. It is not a vital issue on which the fate of our culture turns, but it is a matter about which we ought to let the free and most open conditions that we can create lead us to whatever mix of wampum and currency and electronic signals that we like be the means by which we carry on the business of our society.
>
> **Coates:** You might easily get the impression that I am opposed to EFTS. In fact, I'm very enthusiastic about it .... But ... there are very serious structural problems that are best addressed now rather than later ... to leave the problem of its (EFTS) development solely in terms of incremental change and specific cases and issues in an allegedly free enterprise evolutionary process is the exact analog of treating the problems of women workers in society on an individual piecemeal basis. To overlook the fundamental structural elements is effectively to do a systematic injustice. What you take to be dragging in all the dirty linen of society as part of the question is absolutely essential. But it is not an ideological move peculiar to EFTS. It is rather something that has to be done with all our major technological systems.

It is precisely this debate, which mirrors the larger debate in the society, to which this agenda for EFT research is addressed.

II. An Agenda for EFT Research

Table II presents the EFT research agenda in outline form as a guide to the discussion which follows. Interestingly, this agenda relates closely to the major forces of EFT development outlined in Figure 1. It is significant to note that within the context of the five major areas used to organize the agenda-making process, twelve research topics have been highlighted as warranting first priority attention. The agenda is not a list of specific research projects that need to be conducted, but rather a listing and discussion of research areas in which specific projects might be formulated. Hopefully, it will serve to help stimulate specific research projects.

Table II. EFT research agenda.

I.	*Technological issues in EFT*
	Clarification of technological issues warranting research
II.	*EFT impacts on people*
	Costs and benefits of EFT to the consumer
	Consequences of EFT for the less advantaged
	Education of consumers for dealing with EFT
	Records control and consumer protection under EFT
	Effective and acceptable privacy safeguards
III.	*Economic impact of EFT*
	Costs of the current financial payments system
	Impact of EFT on the financial system and financial institutions
IV.	*Regulation and control of EFT*
	Identification and understanding of new regulatory issues arising from EFT (including the question: Is regulation needed at all?)
	Study of the range and options of organizing EFT-related regulatory structures
V.	*Evaluating and monitoring EFT systems*
	Long-run interactions between EFT and society
	EFT as a study of technological change and impact

The areas given priority on the agenda correspond with responses to a survey questionnaire about EFT research issues. Respondents were asked to identify, from a list of 37 issues, the ten issues they believed of highest priority, and then to rank those issues in descending order of importance (with 10 points for the most important, 9 points for the second most important, etc.). In addition, an "intensity" score was calculated by dividing the number of times the issue was ranked in the top ten by the total points it received. (In other words, if the research issue area has an intensity of 7, it means that on the average those who ranked this issue in the top ten felt it was the third most important issue.) Rankings of intensity are shown in Table III. Finally, respondents to the survey were asked to characterize their institutional view depending on whether they represented a provider, supplier, regulator, researcher, or "other" perspective. And as noted earlier, in a number of cases, the ranking of agenda items varied according to these institutional perspectives.[2]

Technological Issues in EFT

None of the technological issues in EFT ranked high among research topics (Table III). However, the research dimensions of this topic require additional attention because the technologists take three different, conflicting positions on the issues and have tended to prevent clarification.

The first position is that there are no serious technological issues in EFT. The technology can do whatever people want it to do for EFT, and adequate safeguards can be provided for potential EFT technology problems, whether they arise from the technology *per se* or from its use. Those whose values hold close to the *systems model* generally take this view, and the only issue is whether people are willing to pay for adequate safeguards. There-

Table III. Ranking of Research Issues by Conference Participants.

Issue	Total points	Rank among the 37 issues	Intensity
Technological issues in EFT			
Security of EFT	86	15	5.1
Alternative network approaches	84	16	4.9
Alternative communication systems and EFT	82	18	4.8
Reliability of EFT	72	23	4.5
Implications of potential	70	24	4.4
Reversibility of EFT changes	68	25	5.7
EFT impacts on people			
Costs and benefits of EFT to the consumer	269	1	7.3
Educating consumers regarding their EFT-related rights	149	5	5.5
EFT impact on low income consumers	130	8	5.4
EFT impact on individual surveillance	95	14	6.3
Consumer abuse (debit cards stolen, payments initiated)	82	19	4.3
Impact of EFT on consumer behavior	81	20	4.3
Record controls and counterfeiting under EFT	53	28	4.1
Privacy problems and EFT	40	33	4.4
Ombudsman as a means of consumer protection	31	35	5.2
Effects of mandatory disclosure laws on consumer	10	37	3.3
Economic impact of EFT			
Comparative costs of current payments system and EFT	268	2	6.2
Impact of EFT on market competition	104	12	4.2
Impact of EFT on the definition and velocity of money	83	17	4.2
Impact of EFT on smaller financial institutions	67	26	3.7
Impact of EFT on operating and other expenses	63	27	3.3
EFT and float	45	30	2.8
EFT-induced changes in monetary systems	41	32	4.6
Impact as a result of EFT fraud	22	36	5.5
Regulation and control of EFT			
Definition of EFT regulation: what should be regulated	202	3	6.1
Access rules for EFT data	143	6	5.7
Federal government as operator of EFT systems	140	7	5.4
Need for EFT regulation	115	11	5.8
Roles of various federal and state legislatures/regulators	100	13	5.6
Institutionalizing consumer interests	76	21	4.5
Equal access of all to EFT	73	22	4.6
What private institutions should be regulated (bank, nonbank, etc.)?	51	22	3.6
Evaluating and monitoring EFT systems			
EFT impact on the long-range character of society	199	4	6.6
Impact of EFT on other societal institutions	127	9	5.8
EFT as a case study of technological change and impact	116	10	3.7
EFT development in other countries	44	31	4.0
EFT and international fund flows	32	34	4.6

fore, the question is political and economic, not technological. The second position, found particularly among some technology providers, is that there *probably* are no serious technological issues, but the technologists cannot talk about the issues in detail because of possible implications for Federal Communications Commission hearings, government and private litigation, or industry competition. The third position, found among some academicians versed in technology, generally those more tied to *libertarian and populist value models*, is that there really are serious issues regarding reliability, security standards, and competition. "Somebody," they argue, should look into these issues, although they, personally, are not deeply interested in the problem.

The result of this standoff from engagement with technological issues is that the issues continue to receive inadequate public definition and research attention. Consequently, we believe that additional effort must be focused on defining issues requiring research and bringing together representatives of the varying technological perspectives to confront one another directly. Furthermore, research should be conducted on the three issues which received the highest ranking among technological concerns. The first is the technical security of EFT systems. EFT development is proceeding without adequate solutions to computer and telecommunications security, without standards for appropriate levels of security, and without any universally acceptable solution in sight. The second issue is the appropriate configuration of EFT networks. The number of EFT delivery

systems is expected to increase from its present 200 to perhaps 500 independent systems in the 1980s. Yet, in later decades as the economies of scale become apparent, these systems are expected to be integrated into perhaps only 100 large networks [19]. Some systems undoubtedly will be patched together whereas others will be totally rebuilt. Patched systems are predicted to be security risks and prohibitively costly. The integration of EFT networks raises problems of reliability, security, efficiency, and standardization which will need to be solved in order to link existing systems and/or to build new integrated systems [38, 42]. The third issue is the future interface of general purpose telecommunications capabilities and EFT. The future interface of EFT systems with general-purpose telecommunications capabilities potentially extends the scale of networking problems immensely beyond any systems currently in existence [51]. It also raises new problems regarding priority, consolidation of transaction data, and international protocol, among others.

EFT Impacts on People

The impacts of EFT on people, particularly consumers, generally received the highest ranking of all research. The costs and benefits of EFT to the consumer was the highest ranked individual topic both in terms of total points and in terms of highest intensity rating (Table III). In addition, this issue was ranked relatively high for almost all institutional sectors. The data from the survey displayed in Table IV reflects this broad base of support, with all but one institutional sector ranking this consumer-related issue with an intensity of seven or more.

Despite this general agreement on the importance of consumer issues, there was disagreement about how to insure adequate attention to them. Some conference participants felt that market research and competition among financial institutions—the *private enterprise model*—would insure that consumer interests are adequately met by EFT developments. However, others were less sanguine about this prospect. The following exchange [8, ch. 19] illustrates this concern:

> **Coates:** As major consultants to the industry, could you tell us what kinds of socially conscious questions come forward from your clients?
> **Horan:** I think that all market research, all planning of banks, of merchants, of depository institutions are premised on the fact that if the consumer doesn't accept it, you just don't have a market. It's a commercial type of decision.
> **Coates:** I take it the answer is none.
> **Louderback:** I see my clients thinking very carefully about the services that they are going to be offering their customers, their depositors, thinking very carefully because if they offer the right kind of services and satisfy the right kinds of needs, they are going to be more successful than their competitors.
> **Coates:** ... If one says that competition will protect the consumer, I might be willing to accept that in the competitive EFT market, such as POS, point of sale, is today. But I don't think it's an adequate response in a more concentrated market, such as automatic clearinghouses, where for preauthorized debits and credits there is only one game in town, through the association.

In addition to illustrating differences in perspectives on EFT research, this exchange illustrates the fact that the impacts of EFT on consumers might vary considerably depending upon the specific EFT technology being studied. For example, automated teller machines (ATMs) seem to have been well-received by consumers whereas many point-of-sale (POS) terminals appear to have been poorly received by both consumers and retailers [1, 15, 39]. These differences in consumer reaction to different EFT technologies underscore the four key research issues in this area.

The first, as already suggested, is the *costs and benefits of EFT to the consumer.* Very little is known about how much EFT will cost, and how those costs will be allocated to consumers. It is clear that consumers eventually will bear most of the costs regardless of whether they pay through transaction charges or taxes for government subsidy of EFT development, or both. Similarly, little is known about what benefits EFT will bring to consumers, and how those benefits will be distributed among consumers. Much has been said in the promotional literature about the intended benefits of EFT on reduced costs of payment services, increased consumer convenience, increased security of financial transactions, and the like. However, the extent to which these intended consequences actually occur is unclear; and the potential unintended and unanticipated consequences that might result are even less specified. And whether the purported benefits of EFT are desired by consumers is unknown [1, 8]. More importantly, which group of consumers will receive the benefits and which will pay the costs? Humes [20] indicates that high-income, well-educated, financially sophisticated, credit-card-using consumers are the most likely users of EFT services. Yet, if costs are allocated generally over the consuming public and benefits accrue disproportionately to some minority of consumers, this might mean unfair "taxation" of those who do not benefit.

The second issue concerns the *consequences of* EFT *for the less advantaged.* It stems from the possibility that a large group of people might be excluded from EFT services. This group is comprised of disadvantaged, "unbanked" people who constitute 25 percent or more of the population [17, 20]. EFT might either improve the access of these people to financial services, or it might have negative consequences for them, or both. On the positive side, for example, EFT might extend banking services through electronic means into areas not now adequately served by banks. On the negative side, EFT might provide new and abusive methods to garnish wages. It was argued at the conference that without specific government action the net impacts of EFT on the "unbanked" public are likely to be negative because the potential positive benefits will not accrue to them and because these people will not have the knowledge or means to change situations that are harmful to them. However, as Hiltz and Turoff [17] indicate, this need not be the case:

Table IV. Ranking of Selected EFT Issues According to Institutional Perspectives.

	Providers		Regulators		University researchers		Suppliers		
	Financial	Nondeposi-tory institu-tions	State govern-ment	Federal govern-ment	Business/ economics department	Other univer-sity	EFT technology industry	Other	Total
Issue: Costs and benefits of EFT to the consumer									
Number of people responding	24	1	2	17	2	9	6	11	72
Number of times ranked in the top ten	14	1	2	5	2	6	2	5	37
Total points	103	10	17	41	19	26	14	39	269
Intensity	7.4	10	8.5	8.2	9.5	4.3	7	7.8	7.3
Issue: Comparative costs of the current payments system									
Number of people responding	24	1	2	17	2	9	6	11	72
Number of times ranked in the top ten	19	1	2	8	2	3	4	4	43
Total points	119	8	12	42	19	14	25	29	268
Intensity	6.2	8	6	5.3	9.5	4.7	6.3	7.3	6.2
Issue: Definition of EFT regulation: What should be regulated?									
Number of people responding	24	1	2	17	2	9	6	11	72
Number of times ranked in the top ten	11	0	1	10	1	4	3	3	33
Total points	64	0	3	79	7	4	24	21	202
Intensity	5.8	0	3	7.9	7	1	8	7	6.1
Issue: EFT impact on the long-range character of society									
Number of people responding	24	1	2	17	2	9	16	11	72
Number of times ranked in the top ten	9	0	2	4	0	7	2	6	30
Total points	40	0	15	39	0	54	9	42	199
Intensity	4.4	0	7.5	9.8	0	7.7	4.5	7	6.6
Issue: EFT as a case study of technological change and impact									
Number of people responding	24	1	2	17	2	9	6	11	72
Number of times ranked in the top ten	7	1	0	7	2	7	3	4	31
Total points	14	6	0	11	9	46	13	17	116
Intensity	2	6	0	1.6	4.5	6.6	4.3	4.3	3.7

EFT represents an opportunity to purposely shape use of a new technology for social objectives as well as for corporate profits. EFT could facilitate basic changes in the nature and distribution of consumer financial services, and extend the benefits of such services to segments of the society which are currently at a disadvantage in dealing with existing financial institutions. At the very least, policy makers should take care that this new type of financial institution does not promote more inequality.

More than any other, this issue illustrates the potential conflict between the values of the free enterprise perspective and the more socially conscious neopopulist perspective. And probably more than any other issue, it was generally agreed that the *free enterprise model* was an insufficient means of insuring that the opportunity represented by EFT in this area was met.

The third issue requiring research concerns *the education of consumers for dealing with EFT.* Any effort to stimulate widespread adoption of EFT systems will require a coordinated educational effort of considerable scale [24, 48, 49]. It is critical that the educational effort enable consumers to make reasonable choices about whether to adopt the medium, and if so, how. Moreover, since EFT will introduce new levels of complexity in managing personal finances, it might be necessary to consider requiring education in the use of financial media in public schools much as driver's training is now required in many states. Research is needed, therefore, to determine the kinds of education necessary, to develop a knowledgeable public awareness of the EFT debates of the present, and assuming EFTs develop as anticipated, to facilitate knowledgeable and responsible use of the medium.

The fourth issue is *records control and consumer protection under EFT.* Control over financial records and prevention of fraud and other abuses are potential problems with EFT [24, 38, 41, 42, 46, 47, 48, 54]. There is major concern today about the adequacy of consumer protection, as illustrated by a consumer representative's (Kathleen O'Reilly's) comment at the conference [32]:

> Consumers are becoming terribly concerned about the implications of the computer fraud phenomenon. It is far from science fiction. If there is not a commitment to the development of EFT systems that guarantee that appropriate (and available) technological methodology is used to minimize computer fraud (the prime victims of which are consumers), EFTS may well enhance the opportunity for that kind of dangerous abuse.
>
> What of the consumer concerns related to preauthorized payment? Despite the efficiencies that accompany preauthorized payments, there is still the concern that it reduces the actual spending pool availability of individual consumers. For some, such as the suddenly or temporarily unemployed, a real dilemma arises as to which bills to pay first.

The changes introduced by EFT in regard to the philosophy and procedures of financial record-keeping and protection might be dramatic. One critical change is the definition of what constitutes "money" under an EFT system. If money is considered actual or symbolic, EFT represents a major move away from the use of cash to back up the symbols representing assets and liabilities. In such a case, what will be the standard for accounting for a given amount of money? An electronic impulse of certain characteristics over an authorized channel? This might have conseqences for accounting, auditing, and protection of financial records.

Economic Impacts of EFT

Two broad research areas were identified concerning the economic impact of EFT. The first dealt with the economics of EFT, specifically the issue of *the comparative costs of the current payments system and an EFT system.* The intensity of feelings about this issue is indicated by the fact that it was second highest in overall ranking by the conference participants with a total of 268 points (Table III). However, much of the support for this issue came from the financial sector (44 percent or 19 out of 43 people—see Table IV). Eighty percent of the people (19 out of 24) at the conference from the financial sector placed this issue in their top ten rankings. The other large group of participants at the conference who ranked this issue among the top ten were from the federal government (47 percent or 8 out of 17 people). This difference in emphasis among the participants at the conference further illustrates the tension between private and consumer-related interests. For those directly involved in the implementation of EFT, questions concerning the direct costs of the payment system are of the highest priority from both an institutional and a national perspective. For those more interested in the consumer impact, this issue is significant, but not nearly as important.

Al Lipis [33] has noted that "little information is available on the costs of cash transactions, yet such transactions constitute the bulk of payment transactions. Likewise, little is known about the costs of cash and checks to merchants." The overall cost of the United States payment system in 1976 was estimated by Hamilton and Budd [6] to exceed $22 billion, but we do not have a breakdown of the cost of specific areas of the system. The banking industry is therefore implementing EFT services without good comparisons of the overall costs and benefits relative to cash, checks, and credit cards. In essence, there is little evidence today that EFT services are profitable or justified.

Information regarding the cost of our current payments systems is therefore needed to provide the basis for comparison of the costs and benefits of EFT and to provide a common ground for policy decisions. One problem is to determine the cost of cash transactions carried out. Another problem is to determine merchant costs related to the payment system. And still another problem is to discover the economics of banking services from the consumer's perspective.[3]

The second issue dealt with *the impact of EFT on the financial system and financial institutions.* This issue ranked twelfth with a total of 104 points (Table III). The primary question here is the impact of EFT on financial systems in general, and competing financial institutions in particular. Our current financial system is already

undergoing a variety of changes and pressures unrelated to EFT. However, EFT complicates the process and provides added pressure for change [9]:

> EFT is clearly an important part of the change process which is underway. In fact, unlike regulatory or legislative innovations which must evolve slowly through the jockeying of various special interest groups, EFT offers individual financial institutions the opportunity to try to gain a larger share of the retail-banking market. For example, since S & L's are less limited in terms of branching, with EFT they could leapfrog the paper-check system by providing bill-payer services and developing, or linking into, a system of off-premise terminals. Although the evolution of EFT is undoubtedly moving at a slower pace than some expected, the movement is underway as a part of a larger evolution. If EFT were the only change that was occurring, then it might be possible for progress on that front to stop. However, EFT is both a fuel and a passenger in the movement of innovation, and the whole of the change process is greater than the sum of the parts.

What will be the impact of EFT on the comparative market share for different types of financial institutions? To the extent that EFT requires economies of scale, what impact will changes in technology have on smaller institutions? And finally, what impact will EFT have on the overall structure of financial institutions?[4]

Regulation and Control of EFT

Our current system of financial regulation and control is a complex and controversial topic. The United States has a unique system of private financial intermediaries and markets. Compared to other nations, we have a wide range of financial institutions with 14,000 commercial banks, 5,000 savings and loan associations, 500 mutual savings banks, and 22,000 credit unions. The dual banking system is one of the cherished aspects of our financial structure, and, over the years, our government has tended to define and supervise the activities of financial institutions in an overlapping and sometimes competing fashion [9].

The importance of regulatory issues is suggested by the fact that the issue of "defining EFT regulation and what should be regulated" was ranked third highest by the conference participants, receiving a total of 202 points, and in terms of overall intensity it was the fifth highest (Table III). However, ranking of importance seemed to vary. The issue received particularly strong support at the conference from the representatives of the federal government. Of the 33 people who ranked this issue in the top ten, 10 people were from the federal government (Table IV). Like the issue on comparative costs, EFT regulation was ranked highest when viewed purely from an institutional perspective. When viewed from a national perspective, it was only of medium importance.

Once again, then, views differed concerning the amount of regulation appropriate for EFT depending upon the value perspective of the participants. (Also see [24, 29, 49].) One view would rely on the *free enterprise model* to evaluate whether or not EFT innovations were effective by determining whether or not consumers were willing to accept the changes. Those arguing from this perspective find that regulations often retard development, and that too much research might have a negative impact. The other perspective, essentially a *statist model* of government responsibility, argued that the concerns about potential problems could be so great that regulation might be used to slow down development and to avoid "nonexistent" problems. The following dialogue [7] illustrates this debate:

> **Benton:** Is there any reason for the government as an actor to be participating in such a way so that electronic payment systems come into being? The government is supposed to get involved in matters that are of national importance. Is there any evidence that this EFTs is that significant?
> **Cox:** I think the fact that we are dealing with something that is closely related to one of the social instruments for control ... of the health of our economy is the reason why the government has reason to be more interested in the payment system than in some other aspects of our society.
> **Coates:** Government should interfere when there are significant externalities. ... Insofar as electronic funds transfer has effects which are outside the chain of buyers and sellers, and insofar as they become large, one has the argument for government intervention because that is the only alternative mechanism society has for dealing with externalities.
> **Reistad:** The easiest way to determine which of those externalities should be grappled with would be to go into the pioneering of the system and see what evolves from it.

Thus, a range of special and competing perspectives emerge, and many of the issues concerning the first issue in this area—regulation and what should be regulated—are ultimately political judgments. While final policy decisions will be made in the arena of politics and policy choice, research may help to frame the debate and reveal the consequences of alternative choices.

The second regulatory issue concerns *the appropriate mode for regulation and the need for restructuring regulatory institutions.* It is frequently stated by the promoters of EFT and the *private enterprise model* that "the marketplace can serve as an effective regulator of EFT." Yet, there is little evidence either for or against this assertion. Moreover, as noted above, we have an overlapping system of state and federal regulations with notable inefficiencies and problems. Consequently, serious questions exist regarding what the relationship between state and federal regulators should be in the future, and what range of options is available for organizing the regulatory structure related to financial institutions and EFT.

Assuming the decision is made that regulation is required beyond the marketplace, it might be possible to study the range and options of organizing EFT-related regulatory structures. Without institutional restructuring, future regulations are likely to look similar to the regulations of the present and the past. However, perhaps regulatory reform within the financial system is appropriate and a reworking of the existing regulatory strategy may be necessary. Decisions about such reworking could be aided by knowledge about possible reforms and about the value of taking a reform approach as opposed to an amendment approach to existing regulatory policy.

Monitoring and Evaluating EFT Systems in the Broader Context

One of the critical areas for future EFT research relates to the long-term, broad social impacts of EFT, and at the conference two such issues received particularly strong attention. The first, "EFT and Social Change" (dealing with the potential for EFT to bring considerable long-range change in the social and institutional character of society), rated fourth in terms of total points; and the second, "EFT as a Case Study of Technological Change and Impact," was tenth. (See Table III.)

Although the two issues were relatively close in terms of the number of times ranked in the top ten and total points, "EFT and Social Change" received a much higher intensity rating. In fact, its rating of 6.6 was the second highest intensity rating in the entire survey (Table III). This seems reasonable when it is realized that this issue deals with the broad question of EFT and social change, and "EFT as a Case Study of Technological Change" deals with a specific research approach. Intensity concerning the broad issue is high, whereas the specific case study approach was felt to be important by many, but not as intensely.

Of the people who voted for "EFT and Social Change," support was particularly strong from the university and financial communities with comparatively little interest from the federal government (although those from the federal government who were interested gave it a high intensity rating). (See Table IV.) Of those who voted for "EFT as a Case Study" support was again strong from the university community with 9 out of 11 people ranking it in the top ten. (See Table IV.)

The issue of "EFT and Social Change" concerns the long-run interactions between society and EFT. Most discussions of EFT focus on likely impacts that EFT will have on society, assuming that technology is largely a deterministic and *free-market* force in the society. However, the *statist perspective* argues that society also will affect the technology—its regulation, development, use, and impact. This difference in perspective is important because the former view assumes technological determinism, whereas the latter view assumes that EFT technology is an instrument of society and that its impact will be importantly shaped by its interaction with long-term social trends. Coates' criticism [7] of current EFT research is most revealing in this regard:

> The most important limitation I see on the work to date is the absence of any image of the future. There is little awareness one can sense in the reports of the NCEFT that the nation is in a state of major evolution. There is no awareness of the many long-term trends which are remaking our society. There is no sensitivity to the fact that EFT is part of those trends both as an influence and as an effect. This absence of a vision or framework of the future is the single most critical deficiency in the Commission's work.
>
> The second structural deficiency in the work is a near total absence of any general principles which could form a conceptual and analytical framework. For example, a general principle that would have been most useful is that the primary political, civil libertarian and constitutional risks for the American people in the next three decades are from government itself. With that principle informing the deliberations of the Commission, many of its conclusions, I believe, would have come out differently. There would have been a series of sharp and useful distinctions made between the privacy violations or potentials for such violations from the private sector and the much more fundamental and serious violations from government. This incidentally ties in with one's view of the future.

In order to understand the impacts of EFT in society, it is important to identify the broad social trends emerging in the future which will interact with this new technology [8, ch. 14; 28]. Three interrelated questions are involved. The first concerns what long-run changes in society are expected to occur that will interact with EFT. These include changes in life styles, housing preferences, work patterns, transportation and communication systems, retailing and shopping patterns, and similar social patterns. The second question concerns how these changes will interact with EFT systems, and with one another, to affect how EFT systems will be used. The third question concerns what impacts EFT might be expected to have in the society, given different scenarios and patterns of interaction. For example, what effect will EFT, possibly in conjunction with other transportation and communication networks, have on the social mobility of individuals and households at different strata of society? On work patterns? On shopping? On life in the home?

The second research issue focuses on *EFT as a case study of technological change and impact.* Whereas the foregoing research issue concerns forecasting likely interactions and impacts of EFT, this issue concerns baseline measurement and longitudinal monitoring of the actual impacts of EFT and the study of EFT as a general illustration of the interaction of technology, society, and public policy. EFT might be established as a case for study on a continuing basis, in much the same way that weather and public political opinions are now studied. Specifically, EFT affords an opportunity to begin serious research into several general questions about technology and society: how technology emerges; how new technology is handled by existing institutions; how new technologies are assimilated by these institutions and the public; what specific impacts new technologies have; how new technologies create synergistic impacts with other technologies; and how technologies change over time to conform to new circumstances and developments. Each of these represents an aspect of EFT concern that has academic, policy, and practical relevance if carried out over time. (For a further discussion of this topic, see [8, ch. 14].)

Conclusion

Only a few years ago, many technologists and financial experts predicted that electronic funds transfer systems would usher in the checkless-cashless society. But it has not happened. The early predictions about the impact of EFT on the future of the financial system have

gone far wide of the mark [1, 20, 41]. Instead of electronic banking, we have a greatly improved paper-based financial system—one that relies on cash and checks even more heavily than in the past. Thus, EFT technologies are following the same model of innovation diffusion that earlier characterized the introduction and spread of general-purpose computer technologies. The introduction of computers in the 1950s was followed by enthusiastic predictions about how office work and managerial work would be revolutionized. Yet, as we approach the 1980s, research has made it clear that many of the positive impacts of computers in the office and the boardroom have yet to be realized, if they ever will be, and many of the dire impacts have not occurred. The potential for major change may still be there, but the incorporation and routinization of the technology are occurring much more slowly than the early technologists and promoters expected. And most importantly, the technology is being shaped by the organizational and institutional context in which it is used rather than solely serving as a driving force of its own which dramatically reshapes its context. The technology has come to be recognized as simply a tool which is shaped more by the agendas of those who would use it than by the possibilities inherent in the technology. (For example, see [54] and [55].) EFT systems, therefore, may be expected to exhibit a similar evolution through many small incremental changes and adaptations of the technology to changing organizational and societal definitions of its appropriate use.

From the standpoint of public policy, this means that issues surrounding the introduction and use of EFT will remain on the public decision agenda for years to come. The National Commission on EFT is over, but many of the policy issues which it raised have not been settled. Even for those issues which seemingly have been settled, it is likely that new understandings and new experiences with the effects of current public policy will generate recognition of the need for new policy in the future. And policy and technology will be mixed. As EFT technology itself changes and is adapted to new uses, public policy will be needed to deal with the impacts of the technology. But as we develop greater understanding of the ways in which the society might utilize the technology, public policy also will be directed increasingly toward shaping the way the technology is used.

From the standpoint of research, the joint evolution of the technology and the public policy agenda means that continuous monitoring and evaluation of EFT are paramount. Objective, scientific information and knowledge can go a long way toward informing the public decision agenda over the next several years and even decades of policy-technology evolution. In looking back over the agenda, it is important to realize that most of the recommended research is in a middle-time range, probably over the next five to ten years. Only the last two recommendations call for long-term research and for the institutionalization of research regarding the evolution of EFT in the United States. Middle-range research clearly is required and significant. It is important to begin systematic research on EFT systems to continue the momentum created by the National Commission on EFT and to fill the many gaps in needed information faced by the commission. There is also a need to create a cadre of people who are knowledgeable about EFT systems and are capable of doing objective, scientific research in the area, rather than solely client-oriented studies. Much of this research should begin with smaller, specific questions which can be successfully answered within a moderate time frame both as a means of building knowledge and as a means of informing policy in the near future.

However, it is also important to remember that this paper and the research agenda setting process have clearly demonstrated that values toward the evolution of technology and research concerning this evolution vary significantly depending on individual and institutional perspectives. Those interested in the development of the technology will establish their own momentum and information base to justify their movement. It is therefore essential that more than short- or even middle-range research receive attention. Long-term research is essential along with the continual monitoring and evaluating of the evolution of EFT.

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Notes

1. The authors of this paper were the principal investigators of this project. A two-part process was used. It included an exploratory workshop to initially review and identify research needs, and a follow-up conference to more fully analyze ideas and to develop an agenda for future research [8, ch. 1]. The exploratory workshop was conducted in Washington, D.C., on November 18 and 19, 1976, and the conference was held in Boston on June 2 and 3, 1977. Because the conference presented a unique opportunity to systematically solicit the opinions of a broad cross section of interests in EFT, a questionnaire was circulated to all 94 participants seeking to determine their opinions on 37 research issues (culled from the 60 suggestions in the exploratory workshop). The participants were asked to first rank the ten most important issues from the perspective of national interest, and the most important from the perspective of the respondent's institutional interests. The aim of this data collection exercise was not only to derive priority ranking for research issues, but to develop priority rankings for different "target populations."
The agenda-making process was planned and organized by Public Systems Evaluation, Inc. (PSE) of Cambridge, Massachusetts, and the Public Policy Research Organization (PPRO) of the University of California at Irvine. They were supported by a grant from the National Science Foundation to Public Systems Evaluation, Inc.
2. The listing of perspectives noted above represents a collapsing of categories. Respondents were actually asked to classify themselves according to narrower categories, and these were grouped as follows: *providers*: financial, nondepository institutions; *regulators*: state government, federal government; *supplier*: EFT technology industry, other industry; *university researchers*: business/economics departments, other university departments. No special category was provided for "consumers" per se since all of the groups noted above are also consumers. There were several people at the conference who represented specific national consumer groups, and their responses are included in the "other" category.
3. There are different definitions in terms of what the costs are to the

consumer for financial transactions. For example, Lipis [33] noted that Arther D. Little studies [2] estimated that the costs of handling checks to consumers were ten cents per transaction, whereas a study by Hamilton and Budd estimated that the costs per transactions from the consumer's perspective were 42 cents per transaction [6]. If more were known about the economics of consumer payment, we could better evaluate the costs and benefits of EFT from the consumer's perspective.

4. As a final note, few people highlighted the impact of EFT on money and monetary flows as an issue which required priority research attention. There was concern about how we define money and about the influences of EFT on overall monetary policy. However, most of these questions were not questions concerning EFT *per se*, rather they were questions having to do with basic monetary policy of which EFT is only a part, and therefore, they probably need to be considered part of broader research questions dealing with monetary policy. (For a further discussion of this, see [8] and [14].)

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